Steep terrain accelerates erosion

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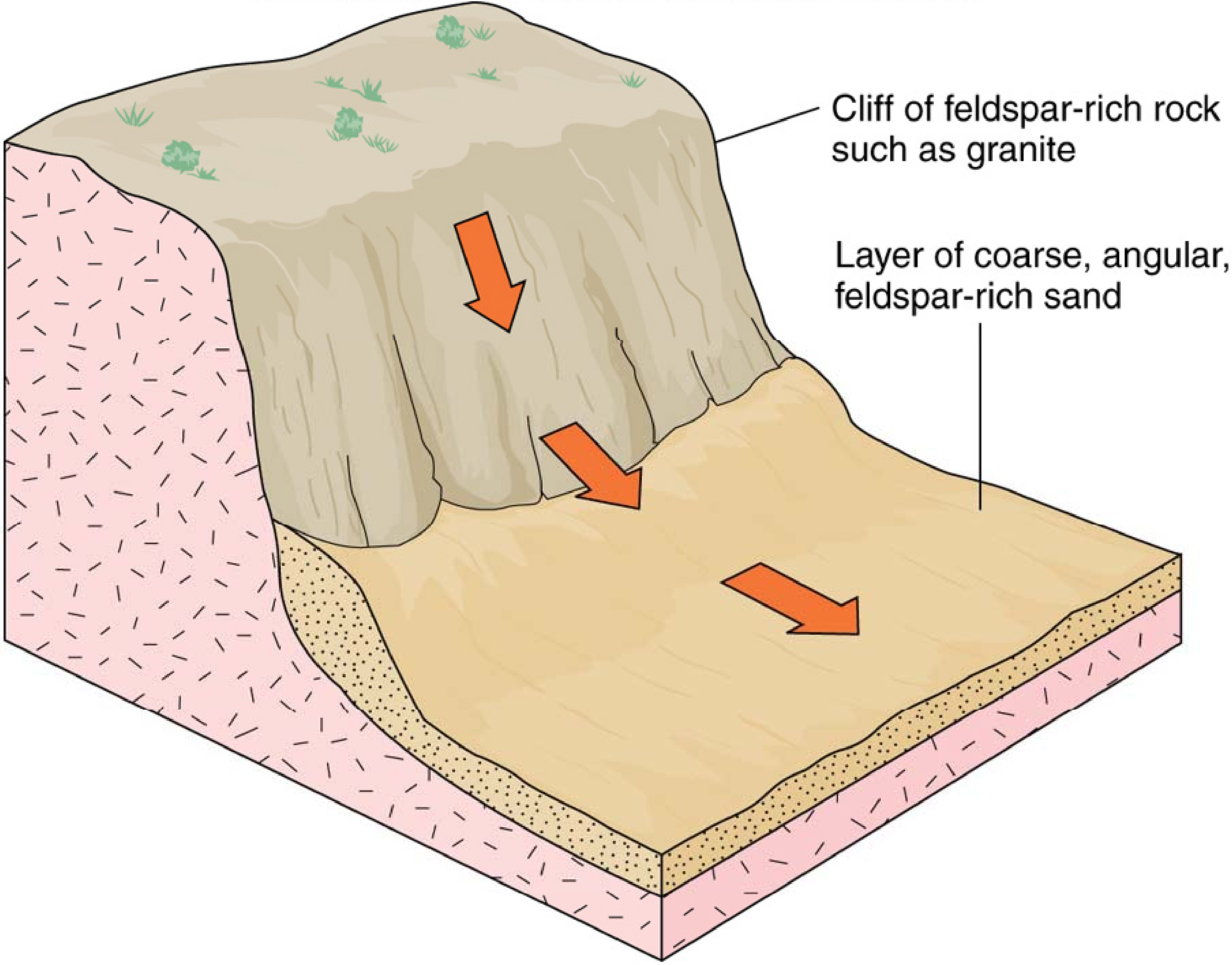
Cliff of feldspar-rich rock such as granite
Layer of coarse, angular, feldspar-rich sand

BY : JHONNY

Turbidity Currents

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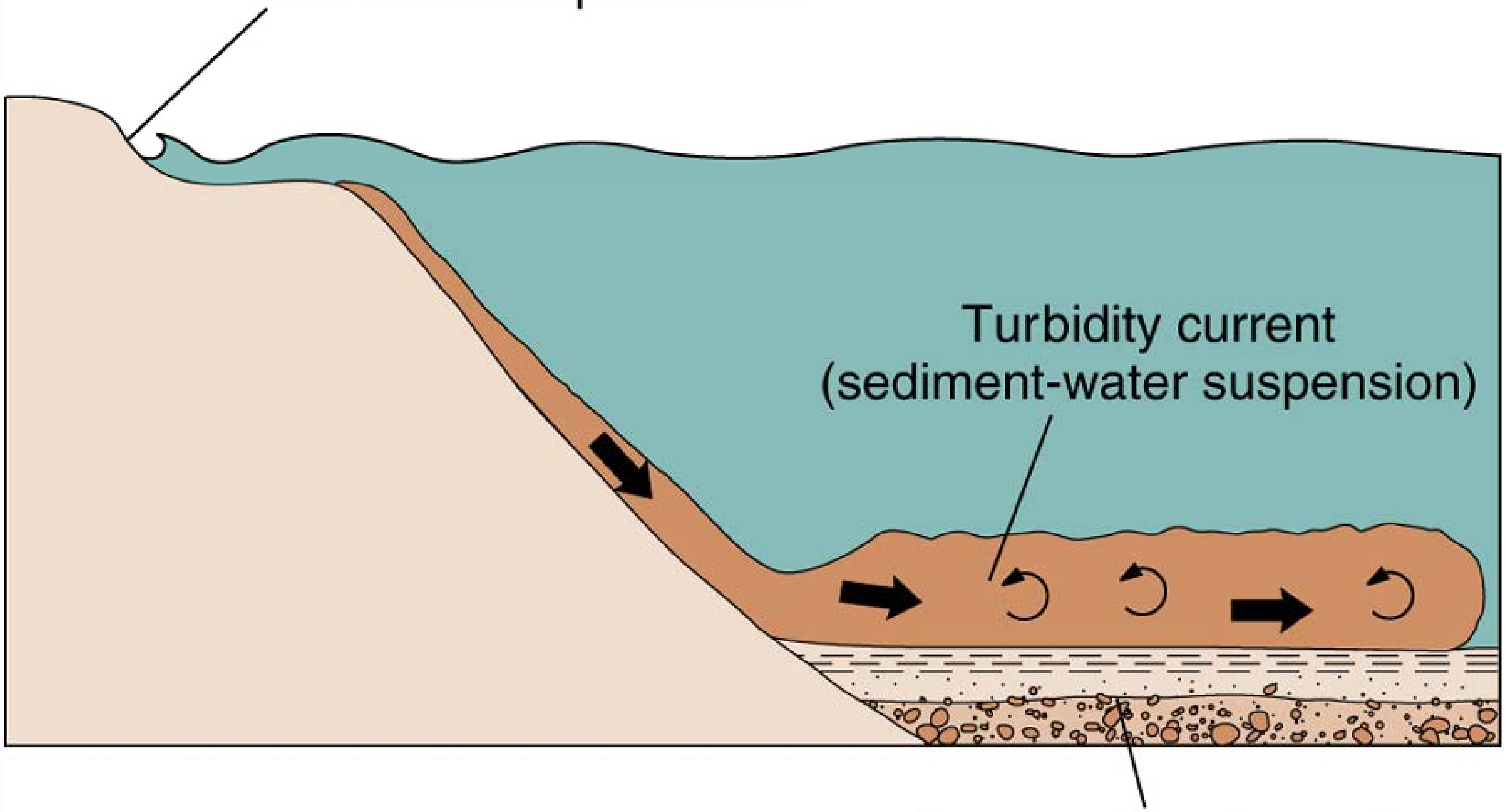
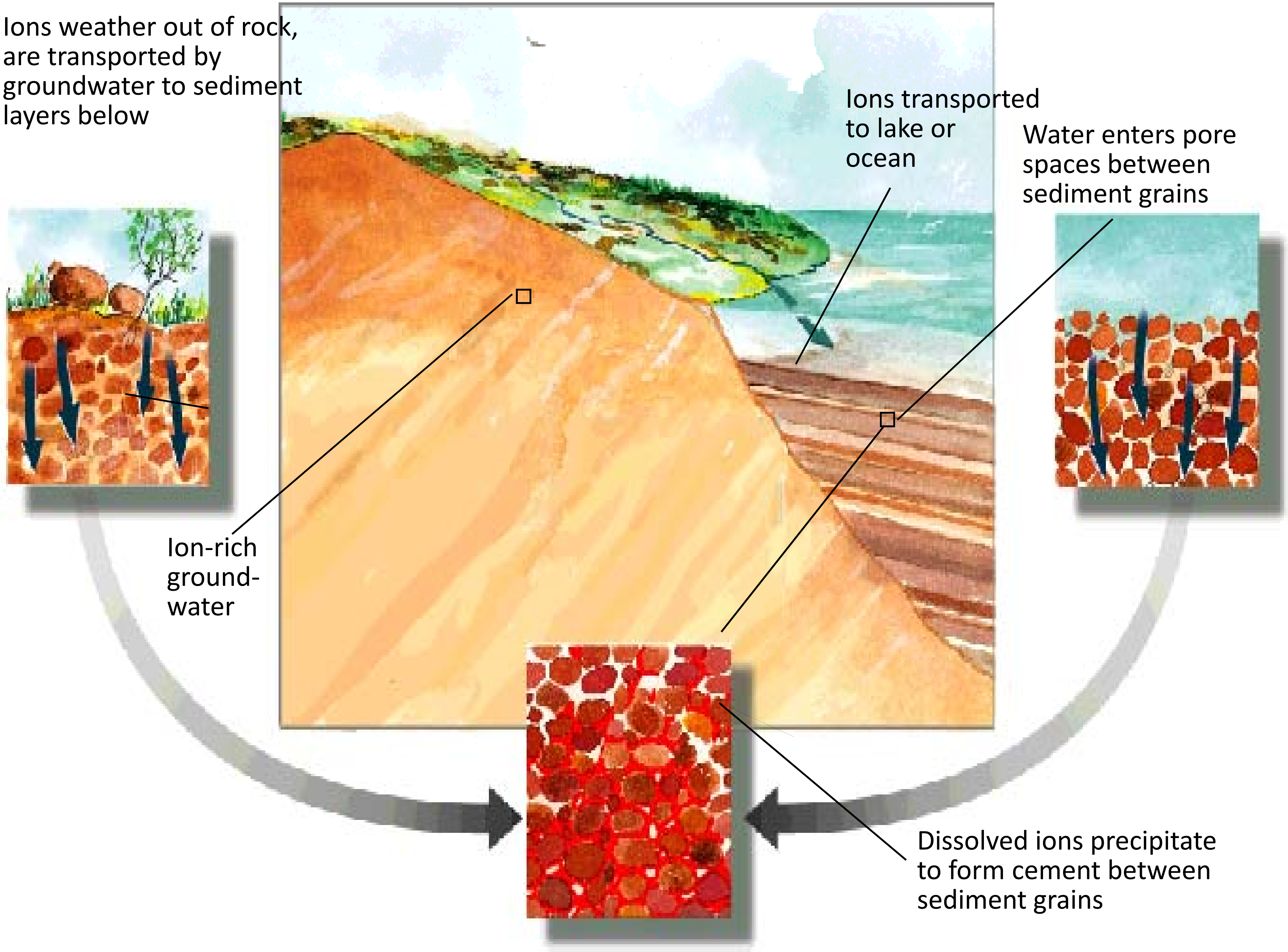


Source area of sedimentary, volcanic, and metamorphic rocks

Turbidity current (sediment-water suspension)

Layers of sediment from previous turbidity currents



Ions weather out of rock, are transported by groundwater to sediment layers below

Ion-rich ground-water

Ions transported to lake or ocean

Water enters pore spaces between sediment grains

Dissolved ions precipitate to form cement between sediment grains

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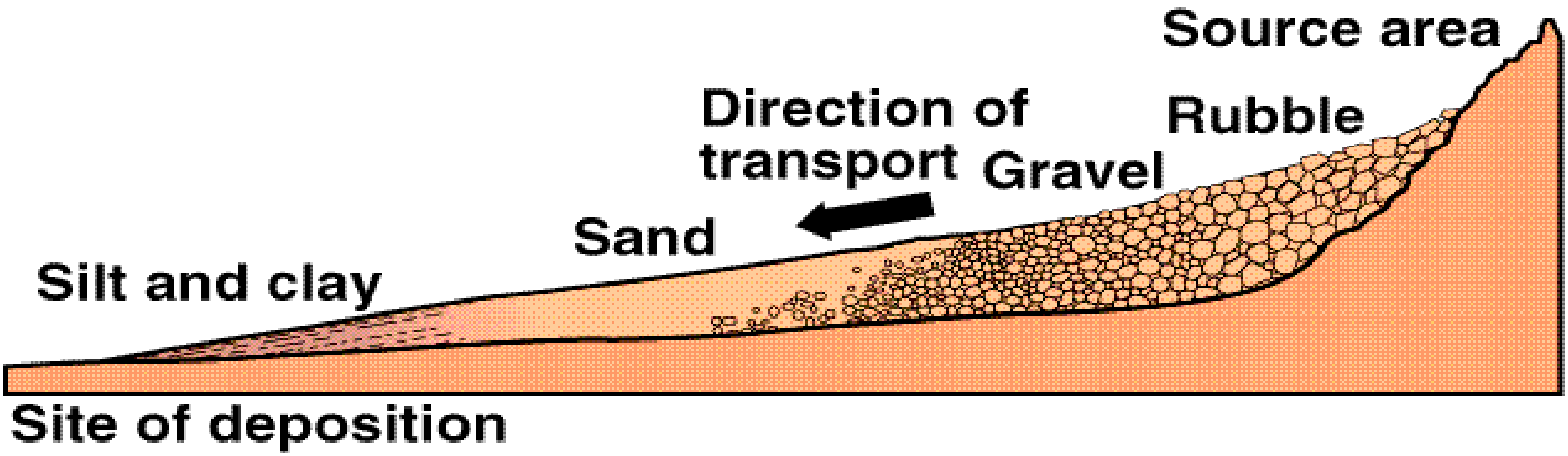
Sediment Deposition around Source Area



Diagenesis includes:

- **Recrystallization** – growth of stable minerals from less stable ones
- **Lithification** – loose sediment is transformed into solid rock by compaction and cementation

  Natural cements: calcite, silica, and iron oxide. Formed from ions in solution in water.

- **Diagenesis – chemical and physical changes that take place after sediments are deposited**

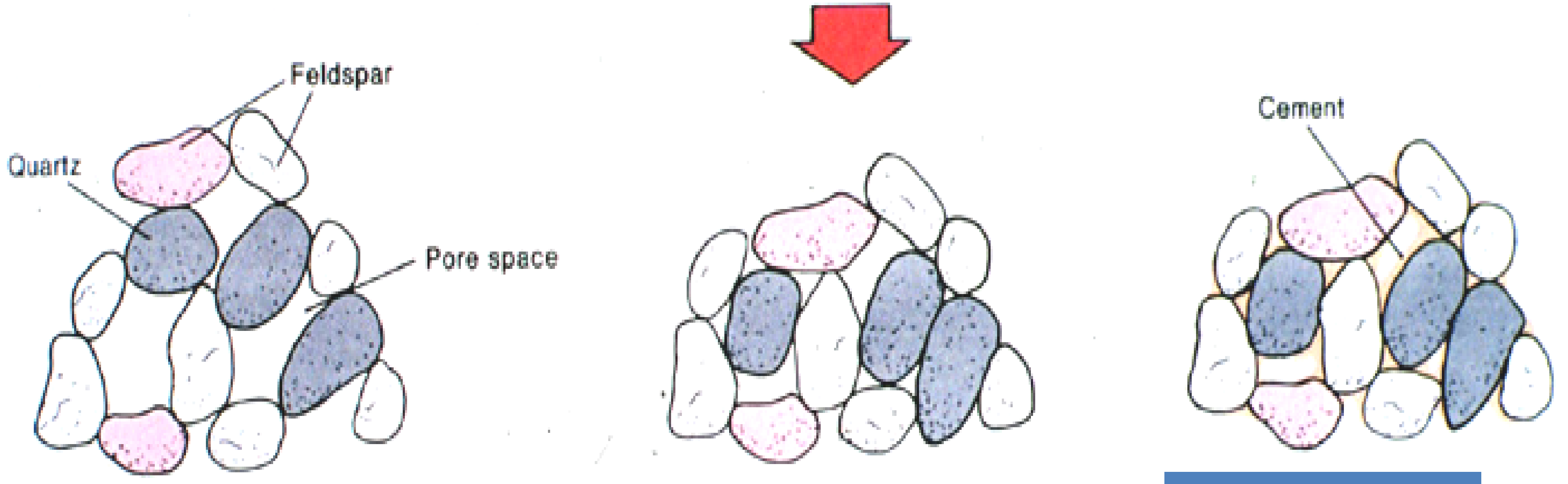
- **Diagenesis varies with composition**

Lithification

- Compaction: As more sediments are piled on top, compaction drives out the excess water.
- Cementation: Precipitation of chemicals dissolved in water binds grains of a sediment together.

Compaction and Cementation of Clastic Sediment into Rock

Overburden



Sediment

Compaction

Cementation

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Lithification and compaction of shale

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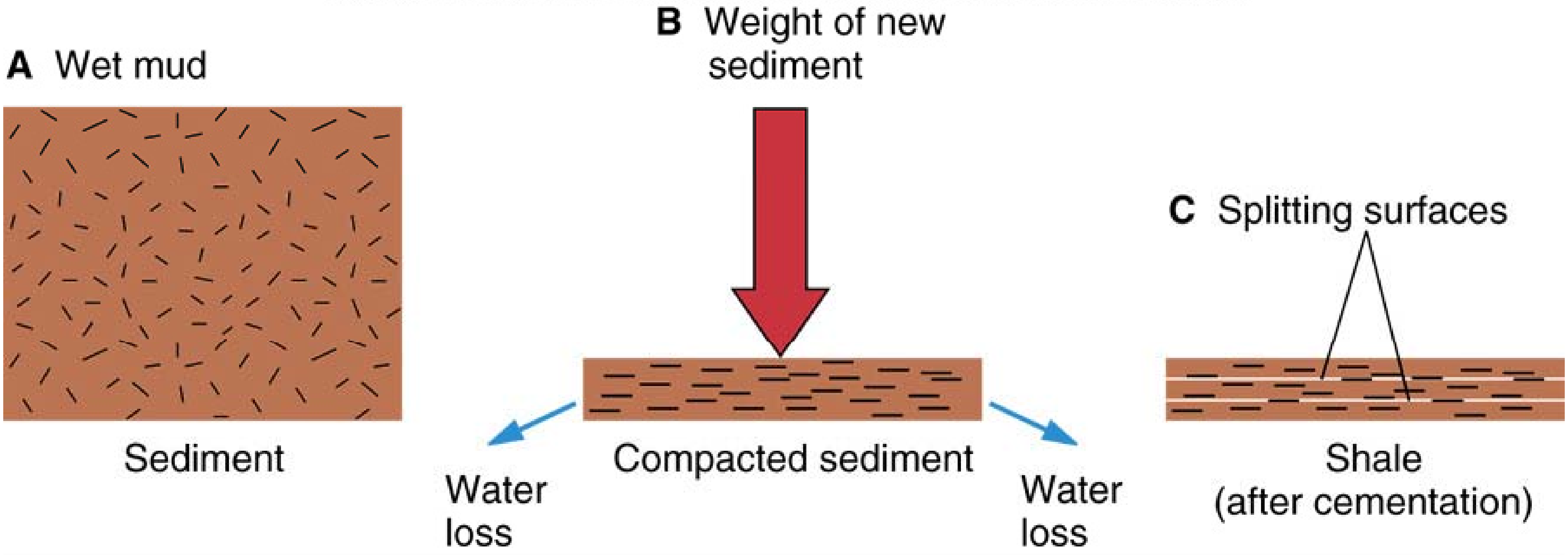

NB volume loss during compaction

- **Source area** - the locality from which the sediment was derived: factors used to evaluate source area include *rock type*, *environment of deposition*, *direction* (*paleocurrents*) and *distance* from source area

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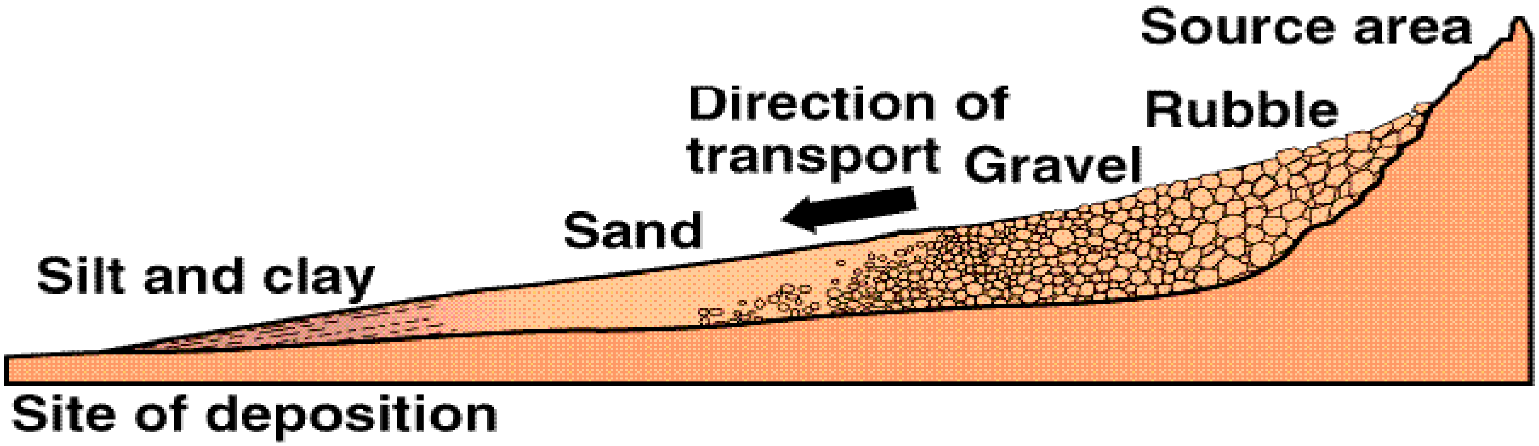
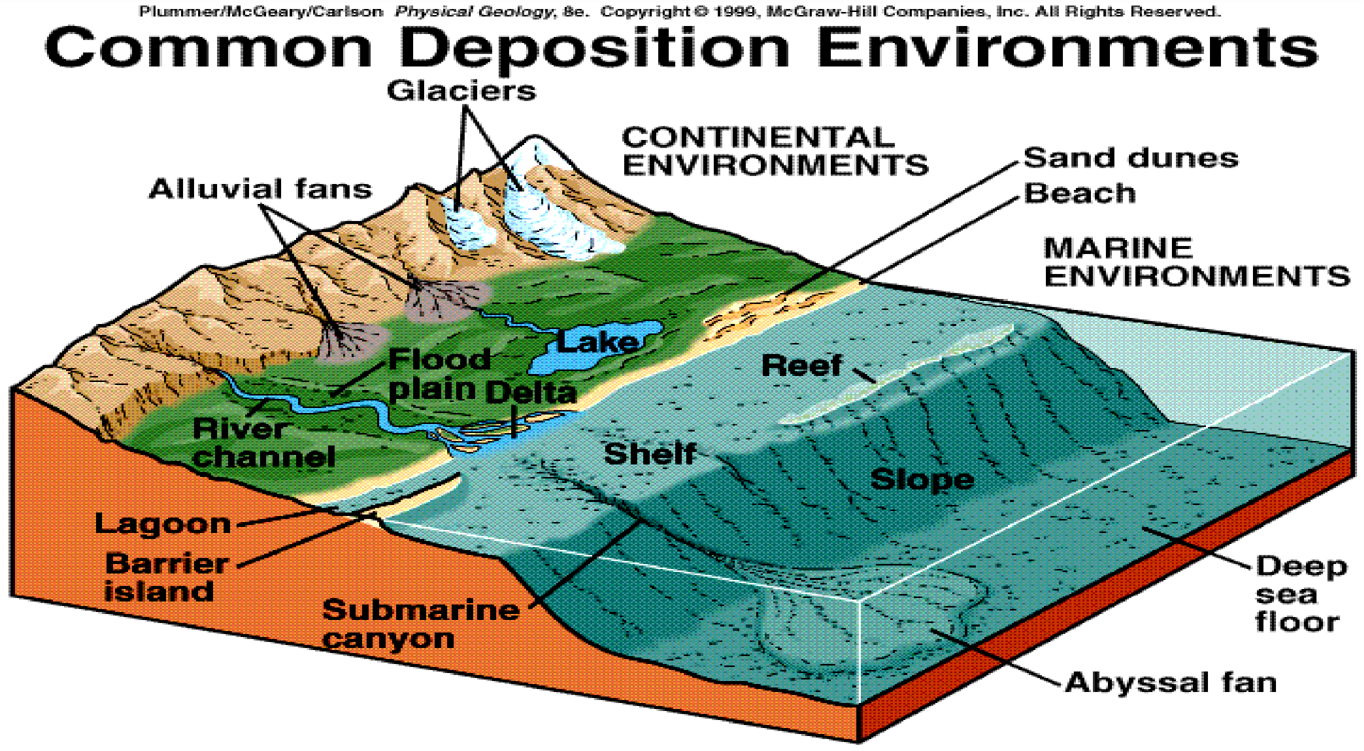
Sediment Deposition around Source Area



- **Depositional environment** – where sediment is deposited. It can be determined by looking at *sedimentary structures* (including fossils), the *bed shape* and *vertical sequences* within the sedimentary layers, and *grain composition*



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Common Deposition Environments

Sedimentary environments & plate tectonic settings

Convergent boundaries – coarse-grained clastic sediments with abundant volcaniclastic and felsic material

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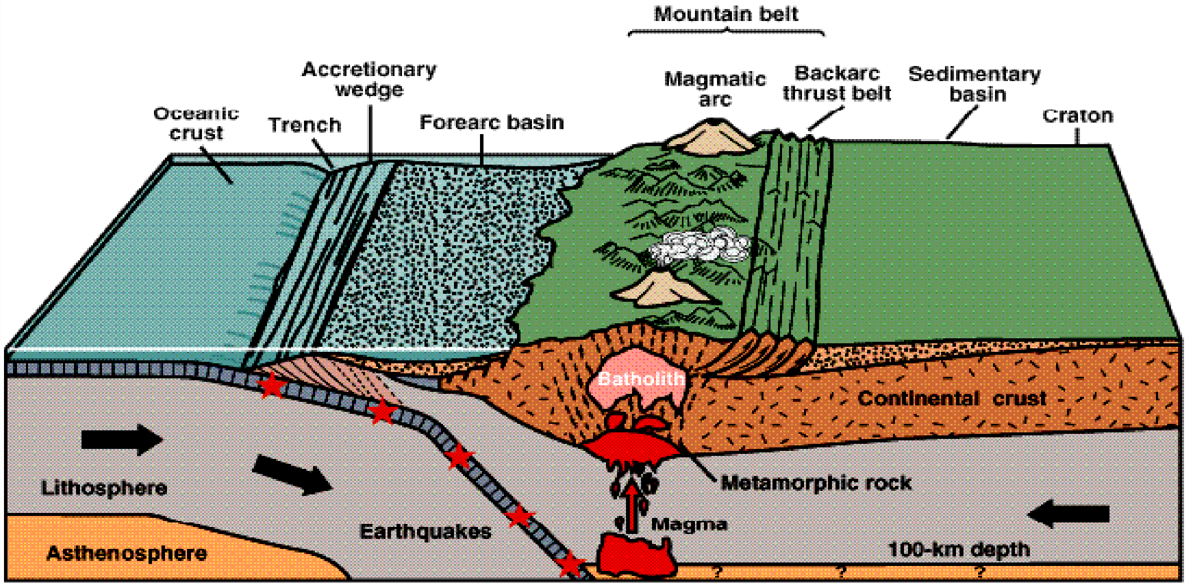
Ocean-Continent Convergence



Sedimentary environments & plate tectonic settings

Divergent boundaries - thick wedges of gravel and coarse sand along margins,with lake bed deposits and associated evaporite rocks possible in bottoms of rift valleys

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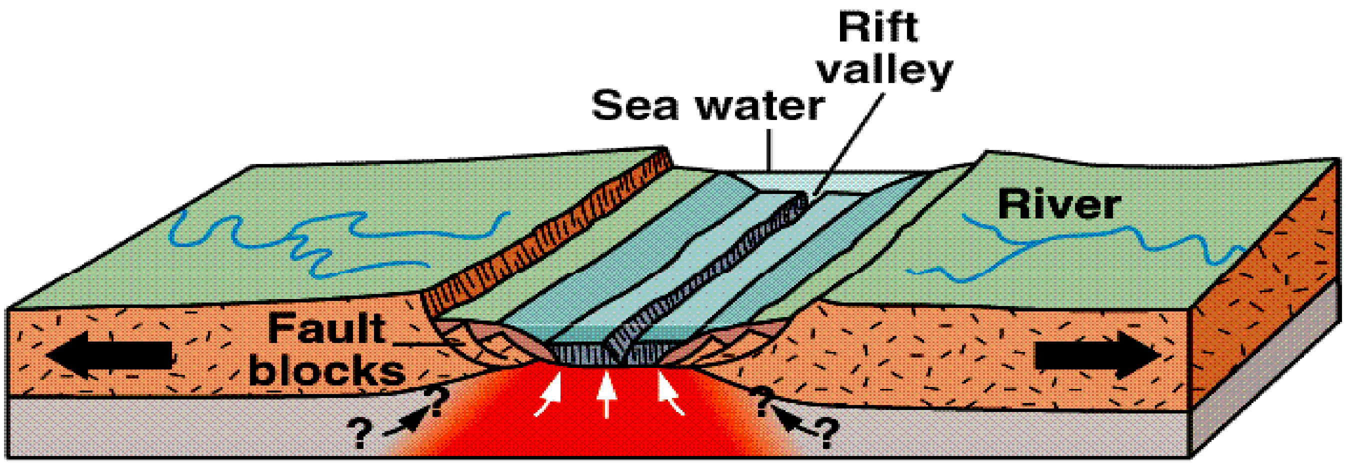
Continent Tears in Two

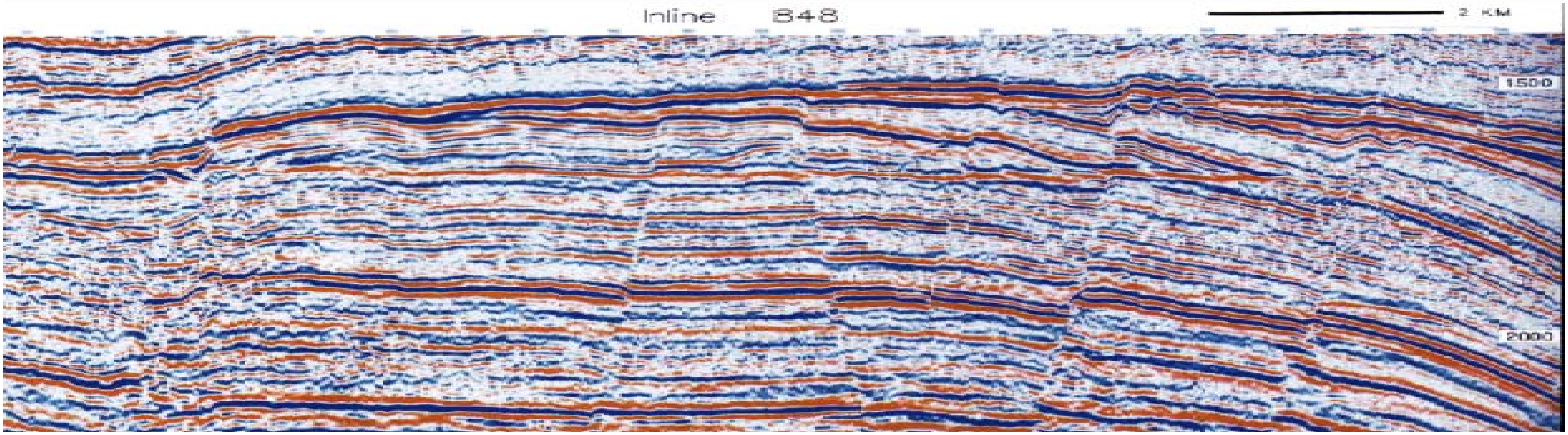


B Continent tears in two. Continent edges are faulted and uplifted. Basalt eruptions form oceanic crust (Red Sea).

What is the economic importance of sedimentary rocks?

- **They are important for economic reasons because they contain**
  - **Coal**
  - **Petroleum and natural gas**
  - **Iron, aluminum, uranium and manganese**
  - **Geologists use them to read Earth’s history**

Remember this when we talk about correlation. Note how beds pinch out or are offset by faults



Thank You…
To be continue…

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